

ABSTRACT

A system for separating a multi phase mixture into a first liquid phase component, a second liquid phase component and a solid phase component includes a three phase centrifuge and a control system for the centrifuge. The control system includes a fuzzy soft sensor programmed with fuzzy logic rules and a feed forward controller in signal communication with the fuzzy soft sensor. The feed forward controller is configured to adjust a feed rate and a feed temperature of the mixture based on the rules, the cold feed temperature, the percent change of water in the mixture, and the percent change of solids in the mixture. The system also includes a feedback controller configured to adjust the feed rate and the feed temperature of the mixture based on the rules, and the basic water and solid (BS&W) content of the first liquid phase component.